

**MECHANICAL ENGINEERING DEPARTMENT  
UNITED STATES NAVAL ACADEMY  
ANNAPOLIS, MD 21402**

12 January 2004

From: Course Administrator, EM472: Mechanical Engineering Design  
To: Students Enrolled in EM472  
  
Subj: Course Objectives and Policy

**OBJECTIVES:**

This is the final course in the sequence of courses that introduces you to the design process. The sequence began with EM375: Mechanical Engineering Experimentation and continued with EM371: Introduction to Design and EM477: Computer Aided Design. EM472 is the culmination of your efforts as engineering students, it will bring together not only the previous design courses but also the courses in the engineering sciences.

As a result of its unique position in the curriculum, this course will not introduce a significant amount of new technical information. Instead it will act as the focal point for the work that has gone on before. The goal of this course is to bring together your previous experiences in engineering, science, humanities and social science. The vehicle for focusing your efforts will be the Capstone Design Project. You selected design teams and prepared a proposal for your project early last semester. Initial design work commenced and you submitted a Concept Package that should have detailed the technical approach and demonstrated significant progress towards your objectives. This semester you will work on completing the objectives you set forth in your proposal.

The course is organized into two lectures and one laboratory period per week. The majority of the time will be devoted to the completion of the project. However, a significant amount of time outside of class will also be required. Some of the initial lecture periods will be used to present new material on economic analysis and professional ethics. These topics will be incorporated into the project.

The Capstone Design Project will be conducted as though you are a design team of engineers in industry. Your instructor will act the part of the engineering vice-president of your company, who has final approval on all aspects of the project. Other faculty who will be involved in grading your presentations during the semester will be considered “financial backers” or board members who have a professional interest in the success of the project. In this context, you will find it necessary to research subjects that you have never “studied” in a formal course at USNA. Examples of this might include environmental impact, product and workplace safety, manufacturing, and economic analysis. You will be expected to address these subjects in your project through research in the library, the internet, faculty and technician staff, and any other source you deem helpful.

## POLICY:

The course syllabus outlines the topics and assignments for the semester. Grades for the course will be based on the following schedule:

Highlights	5%
Homework	5%
Design Notebook	10%
Mid - Term Exam	10%
Critical Design Review	10%
Progress Review	10%
Draft Final Report	10%
Final Report	20%
Final Design Review	10%
Instructor/Team Evaluation	<u>10%</u>
Total	100%

*Attendance* - There will only be a few scheduled meetings that include all of the sections. These meetings are for lectures on new topics and for administration of the Mid-Term Exam. Most of the scheduled class periods are set aside for you to meet with your design groups to assign tasks, discuss problems and review progress. Your design team will establish a weekly meeting with your instructor to review your progress and plans. **Attendance at the lectures and weekly team meetings is mandatory for all team members.** Your design team will be required to make several formal presentations during the semester. Make sure that you schedule your presentation promptly as soon as the sign-up sheet is posted so that you can select a time when all team members can be present.

*Design Notebook* - Each design team will be required to maintain a design notebook, it will contain the proposal, concept package, and the final report. In addition, drawings, design calculations, and the highlights will be kept in the notebook. The notebook must be available for the instructor to review on a weekly basis and it will be submitted to the instructor at the end of the semester for the department to retain.

The following is an explanation of policies concerning the submission of work for grading.

1. Homework must be your own work. However, you may consult with the instructor or other students, in order to gain an understanding of the solution technique or the approach to the problem. Having gained this understanding, you must work through the problem yourself. This will help ensure that you understand the material. Copying another student's solution or a solution manual is not acceptable.
2. Project work submitted will be the joint effort of the team. Again, consultation with other sources is encouraged. However, the submitted work will be clearly understood to be the work of the students whose names are attached to the work. Acknowledgment of help from sources outside the group should be specifically referenced.

3. Students are responsible for the timely submission of all work, late work will be penalized.
4. In the case of open note tests a student may use only his/her own notes.
5. Team members will be directed to grade themselves and their team members on their relative contributions to the team effort. A sample Peer Evaluation Form is included with this document. You will submit peer evaluations for the 6, 12 and 16 week grading periods.

Assoc. Prof. Richard E. Link

## PEER EVALUATION FORM

Team Name: \_\_\_\_\_

Instructor: \_\_\_\_\_

Student ID#: \_\_\_\_\_

Course: \_\_\_\_\_

Date: \_\_\_\_\_

Please fill out this form honestly, being as accurate as you can. Use the following scale:

1- Strongly Disagree      2-Disagree      3-Neutral      4-Agree 5-Strongly Agree

	Your Name	Names of Your Team Mates				
<b>Printed Names →</b>						
Regularly attends group meetings						
Comes to meetings prepared						
Actively participates in group discussions						
Accepts responsibility for major tasks when needed						
Arranges personal schedule to fulfill commitments to the team						
Completes work in a timely and acceptable manner						
Identifies sources and other resources to aid team progress						
Is considerate of needs of others						
Helps others identify strengths and weaknesses						
<b>Totals → (add the individual scores)</b>						